

REMARKS

The Office Action dated February 18, 2003 has been carefully reviewed. Claims 37/48 are pending in this application. Reconsideration of this application is respectfully requested in light of the following discussion.

Rejection of Claims 37-40 under 35 U.S.C. 102(b)

The Examiner has rejected claims 37-40 and 42 as being anticipated by van der Hoeven (U.S. Patent No. 4,789,604, hereafter '604 patent). In particular, the Examiner states the following on page 2 section 2 of the Office Action:

Claims 37, 40: '604 teaches forming a crosslinked polymer coating on paper (a compressible mat) at room temperature (i.e., without heating) (col. 9, lines 43-62) and compressing and heating the mat to form the polymer coated substrate (col. 9, line 63-col. 10, line 4).

The passages of the '604 patent the Examiner refers to read as follows:

As shown in FIG. 1, a pasty liquid 2 (viscosity 50 poise at 25° C) composed of a mixture, polymerizable by radiation, of 85 parts by weight of an aliphatic urethane acrylate oligomer as prepolymer, 15 parts by weight of hexane diol diacrylate as diluent monomer and 10 parts by weight of organic dyestuff pigments is applied to a sulfate kraft paper 1 which has first been impregnated with a heat-curable phenol-formaldehyde resin (amount of resin applied 70%), after the resin has been partly cured by means of rollers, whereupon a continuous film (layer thickness about 80 μ m) is formed. Immediately afterwards, a delustered, biaxially stretched polypropylene single-ply film 3 containing 8% by weight of calcium carbonate of average particle size 3 μ m is applied to this film composed of compounds polymerizable by radiation, and the film is crosslinked in a substantially homogeneous manner by means of electron beams at room temperature without the application of pressure. The dose of radiation absorbed is 60 KGy. (see col. 9, lines 43-62; Emphasis added.)

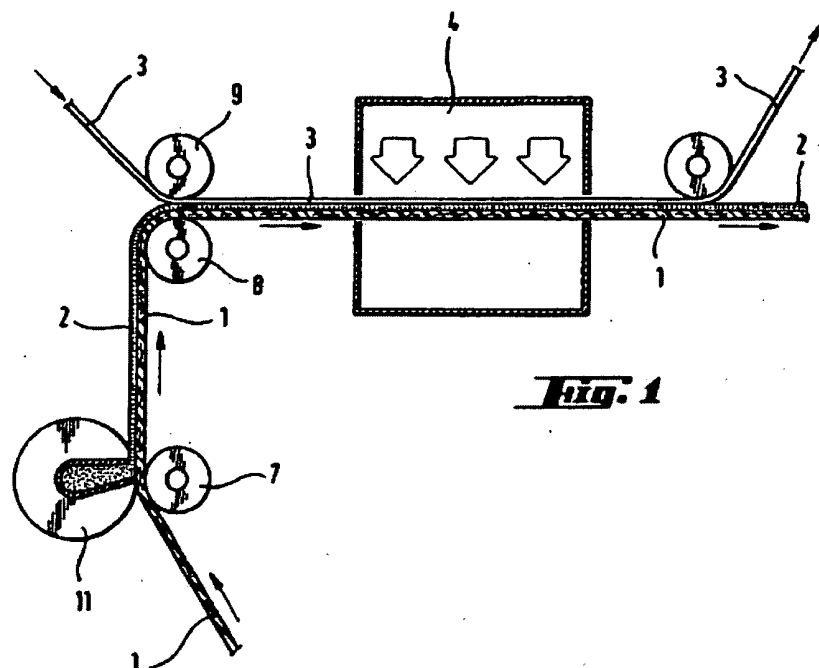
After the plastics film 3 has been removed, the paper 1 with the external layer 2 of synthetic resin copolymerized by radiation is placed in each case on the external face of a stack 13 composed of 50 superposed sheets of paper. The sheets of paper have previously been impregnated with a heat-curable phenol-formaldehyde resin, and the resin has been partly cured. The bundle of layers is compressed at 150° C and 80 bar for 10 minutes in a press between two texturized metal sheets. A bundle has the following composition:" (see col. 9, line 63-col. 10, line 4)

Discussion of Claim 37

As indicated above, claim 37 has been amended to read as follows:

37. A process for the manufacture of polymer coated composite substrate, said process comprising the steps of:
 applying a chemically crosslinkable composition onto a surface of a compressible mat;
 crosslinking the chemically crosslinkable composition without heating to form a chemically crosslinked polymer coating on the surface of the compressible mat, wherein the chemically crosslinkable composition is crosslinked concomitant with the chemically crosslinkable composition being applied to the surface of the compressible mat; and
 compressing and heating the crosslinked coating and the compressible mat to form the polymer coated composite substrate.

As indicated above, a process of claim 37 includes crosslinking the chemically crosslinkable composition concomitant with applying the same to the surface of the compressible mat. Applicants respectfully point out that the '604 patent does not teach crosslinking a chemically crosslinkable composition concomitant with applying the same to the surface of a compressible mat. In fact, as indicated above, the '604 patent specifically teaches crosslinking a composition **after** it has been applied to the surface of the paper as clearly shown in Fig. 1 (Fig. 1 is set forth below for the convenience of the Examiner).



In particular, as indicated by Fig. 1, the '604 patent teaches a coating device 11 for applying a liquid 2 onto the paper 1. After applying the liquid 2, it appears that rollers 8 and 9 partly cure the resin (see column 9, lines 50-53 of the '604 patent). Subsequent to passing through rollers 8 and 9, the film is crosslinked by electron beams of apparatus 4. Accordingly, the Examiner will appreciate that the '604 patent does **not** teach a process that includes crosslinking a chemically crosslinkable composition concomitant with applying the same to the surface of a compressible mat. Therefore, since the '604 patent does not teach each and every element of claim 37 it can not be properly relied upon to support the subject rejection. As such, the Applicants respectfully request that the rejection of claim 37 be withdrawn.

Discussion of Claims 38-40 and 42

Each of claims 38-40 and 42 include claim 37 as a base claim. Accordingly, each of these claims, like claim 37, also include crosslinking the chemically crosslinkable composition concomitant with applying the same to the surface of the compressible mat. Therefore, the above discussion in reference to claim 37 is pertinent to claims 38-40 and 42. As such, Applicants respectfully request that the subject rejection of claims 38-40 and 42 also be withdrawn.

Rejection of Claim 44 under 35 U.S.C. 102(b)

Claim 44 is rejected under 35 U.S.C. § 102(b) as being anticipated by Bailey (U.S. Patent No. 4,505,967, hereafter the '967 patent). In particular, the Examiner states the following on page 2 section 3 of the Office Action:

'967 teaches forming an ionically crosslinked polymer coating (col. 4, lines 20-28) on a compressible mat (col. 4, lines 20-28, 63-64) and compressing and heating the crosslinked coating and the mat to form a polymer coated composite substrate (col. 4, lines 49-63).

The passages of the '967 patent the Examiner refers to read as follows:

An ionically crosslinked copolymer of ethylene and methacrylic acid having a melt index of 0.6 and stabilized to ultraviolet light (Surlyn 1706 UV03 supplied by duPont) was extruded through a thin slot onto a 2-mil-thick (50 micrometers thick) polyethylene terephthalate (PET) carrier film using standard film extrusion conditions. The extruder, slot thickness and speed of the PET carrier film were adjusted to achieve a thickness for the extruded layer of 2 mils (50 micrometers). (col. 4, lines 20-28).....

The microsphere-coated side of the film traveled against the roller 14, and after traveling about 18 inches around the roller, the film engaged a silicone rubber nip roller 15, which was heated to 220° F. At the exit of the heated roll 14 and nip roll 15, the microspheres were found to have been pushed into the extruded layer 10a to about 20-40 percent of their diameter, and the nonembedded surfaces of the microspheres were substantially aligned in a common plane. The film 10, thus covered with microspheres, passes around a cooling roller 17 and then can be wound up in a roll 18 before storage for further processing (alternatively the further processing can be performed in line with the apparatus shown in FIG. 1). (col. 4, lines 49-62)

A cushioning web was prepared by dissolving a polyester resin (Vitel PE307 resin available from Goodyear.... (col. 4, lines 63-34)

Discussion of Claim 44

As indicated above, as amended claim 44 reads as follows:

44. A process for the manufacture of polymer coated composite substrate, said process comprising the steps of:
applying an ionically crosslinkable composition onto a surface of a compressible mat;
ionically crosslinking the ionically crosslinkable composition to form an ionically crosslinked polymer coating on the compressible mat, wherein the ionically crosslinkable composition is ionically crosslinked concomitant with the ionically crosslinkable composition being applied to the surface of the compressible mat; and
compressing and heating the crosslinked coating and the mat to form the polymer coated composite substrate.

As indicated by the language set forth above, a process of claim 44 includes forming the ionic crosslinking concomitant with the application of the ionically crosslinkable composition being applied to the surface of the compressible mat. The '967 patent does not teach this concomitant crosslinking. In particular, the '967 patent teaches "An ionically **crosslinked** copolymer of ethylene and methacrylic acid having" (see column 4, line 20). Therefore, the Examiner will appreciate that the crosslinking taught in the '967 patent is not concomitant with the application of the composition being applied to the surface of the cushioning web. Thus the '967 patent does not teach each and every element of claim 44 and can not be properly relied upon to anticipate the same. Therefore, Applicants respectfully request that the subject rejection of claim 44 be withdrawn.

Rejection of Claims 37 and 42/37 under 35 U.S.C. 102(b)

Claims 37 and 42/37 are rejected under 35 U.S.C. § 102(b) as being anticipated by Potts (U.S. Patent No. 4,238,522, hereafter the '522 patent). In particular, the Examiner states the following:

'522 teaches forming a crosslinked polymer coating on a bandage (i.e., a compressible mat) by radiation or catalyst at 25°C (i.e., without heating) (col. 3, lines 5-22; col. 7, lines 9-11; col. 8, lines 27-66) and heating the crosslinked coating with the slight application of pressure (even slight pressure is sufficient to compress a bandage) and the mat to form the polymer coating substrate (col. 9, lines 1-10). The crosslinking is covalent.

The passages of the '522 patent the Examiner refers to read as follows:

This invention provides improved orthopedic devices and methods and materials for their manufacture. An essential feature of the orthopedic devices of this invention is that they are made using a crosslinked copolymer of a lactone monomer and a polyfunctional acrylate monomer. The precursor from which the crosslinked copolymer is produced is a thermoplastic, crosslinkable copolymer of the lactone monomer and polyfunctional acrylate. The thermoplastic, crosslinkable copolymer is the subject of our copending patent application Ser. No. (D-11,350), the disclosures of which are incorporated herein, and is described in greater detail therein. The thermoplastic, crosslinkable copolymer can be conveniently crosslinked by exposure to radiation, such as electron beam or ultraviolet radiation, or by the known chemical crosslinking agents such as peroxides. (col. 3, lines 5-22)

....The reaction of the lactone, polyfunctional acrylate, and active-hydrogen containing initiator is carried

out at a temperature from 25° to 300°C., preferably from 130° to 225°C. ... (col. 7, lines 9-11)

The crosslinked copolymer in sheet form can have a substrate, in the form of a sheet or web of a different material, bonded to the surface thereof or embedded therein, or the crosslinked copolymer can be impregnated into or coated onto the substrate.

The substrate material can be employed as a supportive substrate or as a soft backing layer disposed between the crosslinked copolymer and the skin of the wearer to act as a cushion. Preferably, the substrate material is one which is flexible and which is solid at temperatures up to 80°C. or higher.

If desired, a conventional fabric stockinette can be placed over the body portion prior to applying the orthopedic device.

As merely illustrative of suitable substrates for such purposes one can mention:

(a) fabrics or nettings of synthetic or natural materials which can have continuous or foraminous surfaces. Included therein are cellulosic fabrics such as flannel or gauze made from cotton; rayon; blends of cotton or rayon; blends of cotton or rayon with synthetic fibers such as poly(ethylene terephthalate), polyacrylonitrile, nylon, polyester, polyethylene, and polypropylene fibers, and the like; and glass fiber cloth;

(b) non-porous sheets or webs of polymers such as extruded, cast, or calendared sheets of: cellulose derivatives, for example, nitrocellulose, solid cellulose ethers including ethyl cellulose, methyl cellulose, hydroxy ethyl cellulose, carboxy methyl cellulose, cellulose esters such as cellulose acetate, and the like; nylons; thermoplastic polyurethanes; polyesters of polycarboxylic acids and polyhydric alcohols; the normally solid acrylic polymers and copolymers, such as poly(methyl methacrylate), poly(ethyl methacrylate) and the like; elastomers such as natural rubber and synthetic rubbers, including butyl rubber, polybutadiene rubber, polyisobutylene rubber, acrylonitrile-butadiene-styrene rubbers, and silicone rubbers; and

(c) flexible foams such as polyurethane foam, foam rubber, or natural sponge. (col. 8, lines 27-66)

...method, a single sheet, having the thickness desired in the applied orthopedic device, is heated to a temperature above the softening point of the crosslinked polymer and the softened sheet is manipulated to conform to the surface contour of the body portion to which it is applied. If the orthopedic device being formed is of the type which completely encases the body portion being treated, i.e. a cast, then the edges of the heated sheet are brought together in overlapping or abutting fashion and fused, by the application of pressure if necessary. The ... (col. 9, lines 1-10)

Discussion of Claims 37 and 42/37

As discussed above, both of claims 37 and 42/37 include crosslinking the chemically crosslinkable composition concomitant with applying the same to the surface of the compressible mat. As indicated above, the '522 patent does not teach crosslinking the chemically crosslinkable composition concomitant with applying the same to the surface of the compressible mat. As such, the '522 patent does not teach each and every element of claims 37 and 42/37. Therefore, the '522 patent can not be properly relied upon to anticipate the subject claims, and the Applicants request that the rejection be withdrawn.

Rejection of Claims 37 and 42/37 under 35 U.S.C. 102(b)

Claims 37 and 42/37 are rejected under 35 U.S.C. § 102(b) as being anticipated by Fertell et al. (U.S. Patent No. 4,601,951, hereafter the '951 patent). In particular, the Examiner states the following:

'951 teaches forming a crosslinked polymer coating on leather (i.e., a compressible mat) (col. 7, lines 59-68). The immersion bath does not appear to be heated.

The crosslinked coating and the mat are heated and compressed to form the polymer coated substrate (col. 8, lines 24-25). The crosslinking is covalent.

The passages of the '951 patent the Examiner refers to read as follows:

:....composed of 2 parts by weight of a crosslinked polyurethane dispersion prepared in accordance with Example III of U.S. patent application Ser. No. 947,544, previously cited herein, and one part by weight of a crosslinked polyurethane dispersion recited in U.S. Pat. No. 4,171,391, incorporated herein by reference. The dispersion blend was adjusted to 25 percent solids. After the leather sheet was fully impregnated with polyurethane dispersion, it was removed from the bath and excess dispersion was removed from the sheet by wiping. The..." (col. 7, lines 59-68)

"Two sheets of the impregnated leather composition of Example I were placed back to back and pressed at ..." (col. 8, lines 24-25)

Discussion of Claims 37 and 42/37

As discussed above, both of claims 37 and 42/37 include crosslinking the chemically crosslinkable composition concomitant with applying the same to the surface of the compressible mat. As indicated above, the '951 patent does not teach crosslinking the chemically crosslinkable composition concomitant with applying the same to the surface of the compressible mat. As such, the '951 patent does not teach each and every element of claims 37 and 42/37. Therefore, the '951 patent can not be properly relied upon to anticipate the subject claims, and the Applicants request that the rejection be withdrawn.

Rejection of Claims 37 and 42/37 under 35 U.S.C. 102(b)

Claims 37 and 42/37 are rejected under 35 U.S.C. § 102(b) as being anticipated by Dyksterhouse et al. (U.S. Patent No. 4,894,105, hereafter the '105 patent). In particular, the Examiner states the following:

'105 teaches forming a covalently crosslinked polymer coating on a fiber tow (i.e., a compressible mat) (col. 19, line 25-col. 20, line 16). The immersion bath does not appear to be heated, and in fact, heating the bath would contradict the teachings of increasing viscosity (col. 3, lines 40-46).

The passages of the '105 patent the Examiner refers to read as follows:

"1045 grams of solid particles of polyetheretherketone thermoplastic polymer are dry blended with 64 grams of solid particles of water-soluble polyacrylic acid binding agent possessing a molecular structure which is cross-linked with polyalkenyl polyether. The polyetheretherketone is commercially available from Imperial Chemical Industries, London, England, as Grade 450 KX1033 Victrex polymer, possesses a glass transition temperature of approximately 143°C., and possesses a melting temperature of approximately 343°C. The polyetheretherketone is ground to a mean particle size of 18 microns with the largest particle size being 90 microns. The water-soluble binding agent is commercially available from B. F. Goodrich as Grade 910 Carbopol polymer and has a molecular weight of approximately 750,000.

An alkyl phenoxy polyethoxy ethanol surfactant in a quantity of 1.2 grams is dissolved in 4800 grams of distilled water and the blend of solid particles of thermoplastic polymer and water-soluble binding agent are added while present in an impeller agitator operating at a moderate speed. The surfactant is commercially available from Rohm and Haas Company as Triton X100 surfactant. Such mixing is conducted for two

hours in order to completely dissolve the water-soluble binding agent and to disperse the particles of thermoplastic polymer. The pH of the resulting dispersion is found to be 2.7. The viscosity of the dispersion is found to be 6,000 cps. when measured with a Rheometrics Stress Rheometer (Model RSR/M) while operating at a shear rate of 0.01 reciprocal second. The Brookfield Yield Value of the dispersion is found to be 4.3 dynes/cm² when tested on a Brookfield RVT viscometer as previously described.

140 grams of a 10 percent sodium hydroxide solution next are added to the dispersion while undergoing moderate agitation. This raises the pH of the dispersion to 6.1 to form an improved gelled impregnation bath wherein the viscosity of the resulting bath is substantially increased to approximately 81,000 cps. (as measured with a Rheometrics Stress Rheometer (Model RSR/M) at a shear rate of 0.01 reciprocal second) through an extension of the molecules of the dissolved binding agent. The resulting impregnation bath exhibits plastic flow with shear-thinning behavior. The Brookfield Yield Value of the dispersion is found to be 56 dynes/cm.² when tested on a Brookfield RVT viscometer as previously described. It can be calculated as previously described that the Minimum Brookfield Yield Value required to suspend the largest particles of thermoplastic polymer present in the dispersion is 9.4 dynes/cm². Accordingly, the resulting impregnation bath is highly stable and the actual Brookfield Yield Value exceeds the calculated Minimum Brookfield Yield Value to suspend even the largest thermoplastic polymer particles present by more than 5 times.

The resulting impregnation bath is next poured into an impregnation apparatus similar to that illustrated in FIG. 25 containing several stationary non-rotating bars immersed within the bath....(col. 19, line 25-col. 20, line 16)

...(b) substantially increasing the viscosity of the dispersion to form an improved impregnation bath whereby the viscosity of the resulting bath becomes at least 50,000 cps. and the impregnation bath has a plastic flow characteristic with shear-thinning behavior which is sufficient to substantially uniformly suspend the particulate thermoplastic polymer within said bath, ...”(col. 3, lines 40-46)

The crosslinked coating and the mat are heated and compressed to form the polymer coated substrate (col. 20, line 68-col. 21, line 14).

“...particles well bound therein. Twelve flat piles containing approximately 36.9 percent by weight of the thermoplastic particles measuring approximately 30.5 cm x .30.5 cm are laid up in the 0° direction in a matched metal mold at room temperature conditions and placed in a platen press. The mold is heated to 290°C. with no applied pressure, and is held at 290°C. for 60 minutes with no applied pressure in order to allow volatiles to escape. A pressure of 2.1 MPa next is applied and the temperature is gradually raised to 385°C. where it is held for another 60 minutes. The mold is then cooled to 50°C. while continuing to maintain the 2.1 MPa pressure. The mold finally is removed from the press and the resulting composite article in the form of a panel is removed from the mold.” (col. 20, line 68-col. 21, line 14)

Discussion of Claims 37 and 42/37

Once again, both of claims 37 and 42/37 include crosslinking the chemically crosslinkable composition concomitant with applying the same to the surface of the compressible mat. The '105 patent does not teach crosslinking the chemically crosslinkable composition concomitant with applying the same to the surface of the compressible mat. As such, the '105 patent does not teach each and every element of claims 37 and 42/37. Therefore, the '105 patent can not be properly relied upon to anticipate the subject claims, and the Applicants request that the rejection be withdrawn.

Rejection of Claims 44 and 48 under 35 U.S.C. 102(b)

Claims 44 and 48 are rejected under 35 U.S.C. § 102(b) as being anticipated by Matejka et al. (U.S. Patent No. 4,517,228, hereafter the '228 patent). In particular, the Examiner states as follows:

'228 discloses a process for coating a fiber mat with a cross-linkable coating prior to heat and pressure treatment (Abstract). Applicant asserts in the specification (p. 7) that the process of WO96/22338 causes ionic cross-linking to produce thermosetting resins by using an anionic surfactant in the cross-linking composition. '228 discloses the use of an anionic surfactant in the cross-linking composition (col. 4, lines 1-7). Therefore, '228 teaches the use of ionically-crosslinked compositions. Applicant argues that the coating crosslinks on application of heat. Thus, Applicant admits that '228 teaches the formation of a crosslinked coating. Thus, the formation of the cross-linked coating can be broken into two phases, the beginning, in which cross-linking begins and forms an at least partially cross-linked coating, and the end in which heat and pressure continues to be applied to finish the cross-linking.

The passage of the '228 patent the Examiner refers to read as follows:

"...cps, at a solids content of about 40 to about 60 percent by weight. The preferred emulsions useful herein are the nonionic surfactant stabilized emulsions based upon, for example, the various polyethylene oxide and polypropylene oxide-based phenolic-type surfactants. However, the anionic and cationic surfactant stabilized emulsions may also be employed herein." (col. 4, lines 1-7)

Discussion of Claims 44 and 48

The Applicants respectfully point out that the '228 patent only mentions using anionic and cationic surfactants to stabilize emulsions. The '228 patent is devoid of any teaching of a process that includes forming the ionic crosslinking concomitant with the application of the ionically crosslinkable composition being applied to the surface of the compressible mat as recited in claim 44. Claim 48 includes claim 44 as a base claim and thus also recites the same limitations as claim 44. Accordingly, the '228 patent does not anticipate either claim 44 or claim 48. Thus, Applicants respectfully request that the subject rejection be removed.

Claims 41 and 43-48 are rejected under 35 U.S.C. § 103(a)

Claims 41 and 43-48 are rejected under 35 U.S.C. § 103(a) as being unpatentable over van der Hoeven '604 in view of Helmer et al. (WO 96/22338, hereafter "338). In particular, the Examiner states the following:

'604 teaches the use of crosslinking acrylate polymers (col. 5, lines 1-62) to provide decorative coatings. It does not explicitly teach the use of ionically crosslinked polymers.

'338 teaches the formation of a quick drying paint (i.e., a decorative coating) comprising crosslinking acrylate polymers (pp. 3, 7). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have used these polymers in place of those of '604 in order to have achieved faster curing with a reasonable expectation of success because they are decorative crosslinkable acrylate polymers disclosed as having the advantage of hardening quickly. Applicant states that these polymers are ionically crosslinked, thermosetting polymers.

The passages of the '604 patent the Examiner refers to read as follows:

"The components used have a strong tendency to polymerize by a free radical mechanism under the action of actinic radiation. Suitable actinic radiation is a light in the near UV region or high-energy radiation, for example electron, particle or x-ray radiation. The prepolymer which can be polymerized by free radical mechanism is a polyfunctional, unsaturated aliphatic or aromatic acrylate or methacrylate, preferably an unsaturated polyester acrylate oligomer and especially an aliphatic urethane acrylate oligomer. Although aromatic urethane acrylate oligomers also produce scratch-resistant surface coatings, these yellow after some time in exterior applications.

In addition to the prepolymer, a mono-, di-, tri-, tetra-, penta- or hexaacrylate or -methacrylate, preferably a diacrylate or triacrylate, is used as an additional suitable monomer or oligomer in the mixture which can be copolymerized by a free radical mechanism. These mono- to hexaacrylates or mono- to hexamethacrylates are esters of polyols having 1 to 6 OH groups with acrylic acid or methacrylic acid, respectively, and are therefore also known as polyol acrylates or polyol methacrylates, respectively. Suitable diacrylates are esters of acrylic acid with aliphatic, dihydric alcohols, in particular ethylene glycol, 1,2-propylene glycol, 1,3-propyleneglycol, butane diols, 1,6-hexane diol or neopentylglycol, with aliphatic ether-alcohols, in particular diethylene glycol, dipropylene glycol, dibutylene glycol, polyethylene glycols or polypropylene glycols, with oxyalkylated compounds of the above-mentioned aliphatic alcohols and ether-alcohols or with aromatic dihydroxy compounds, in particular bisphenol A, pyrocatechol, resorcinol, hydroquinone, p-xylyleneglycol or p-hydroxybenzyl alcohol. Preferred diacrylates are 1,6-hexanediol diacrylate, tripropylene glycol diacrylate and 1,4-butanediol diacrylate. Preferred triacrylates are trimethylolpropane triacrylate and pentaerythritol triacrylate.

In addition to the urethane acrylate oligomers and unsaturated polyester acrylate oligomers already mentioned, suitable polyfunctional prepolymers are also epoxy-acrylate and silicone-acrylate oligomers, which are preferably used together with the diacrylates or triacrylates mentioned in the mixture which can be copolymerized by a free radical mechanism.

The prepolymers are compounds known per se and are prepared, for example, from hydroxylated copolymers in which the hydroxyl groups are distributed statistically along the copolymer chain. Statistically unsaturated acrylic copolymers are obtained from this copolymer by esterifying the hydroxyl groups with acrylic acid. Semi-terminal unsaturated acrylic copolymers are prepared by having the hydroxyl group at the end of the chain in the preparation of the hydroxylated copolymers. Urethane acrylate oligomers are prepared by reacting (meth)acrylic acid esters containing hydroxyl groups, for example, hydroxyethyl methacrylate, with polyfunctional isocyanates, preferably diisocyanates. The diisocyanates or polyisocyanates can preferably be reaction products of diols, polyether-diols or polyester-diols containing a stoichiometric excess of monomeric diisocyanate or polyisocyanate." (col. 5, lines 1-62)

Discussion of Claims 41 and 43-48

Each of claims 41 and 43-48 recite forming the crosslinks concomitant with the application of the crosslinkable composition being applied to the surface of the compressible mat. As previously discussed, van der Hoeven (i.e. the '604 patent) is devoid of any teaching or suggestion of forming the crosslinks concomitant with the application of

the crosslinkable composition being applied to the surface of the compressible mat. The '338 reference is directed to a quick drying paint. The '604 patent is devoid of any discussion suggesting that compositions which cure faster than those disclosed in this reference (i.e. the '604 reference) are desirable. Accordingly, in the absence of the Applicants own specification, there is no motivation as to why one of ordinary skill would attempt to substitute the quick drying paint of the '338 reference for the compositions utilized in the '604 patent. Applicants respectfully remind the Examiner that the application of hindsight analysis is improper. Thus, the proposed '604/'338 combination is not proper and can not be relied upon to support an appropriate prima facie case of obviousness. As such the Applicants respectfully request that the subject rejection be withdrawn.

Claims 41 and 43-48 are rejected under 35 U.S.C. § 103(a)

Claims 41 and 43-48 are rejected under 35 U.S.C. § 103(a) as being unpatentable over van der Hoeven '604 in view of Kunz (U.S. Patent No. 5,157,073, hereafter the '073 patent). In particular, the Examiner states as follows:

'604 teaches the use of crosslinking acrylate polymers (col. 5, lines 1-62) to provide scratch-resistant coatings. It does not explicitly teach the sue of thermoset, ionically crosslinked polymers.

'073 teaches the use of thermosetting, ionically-crosslinked acrylic polymers (col. 1, lines 9-66) to provide hard, protective coatings (col. 3, lines 1-10).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used the thermoset, ionically-crosslinked polymers of '073 as the particular polymers of '604 with a reasonable expectation of success and with the expectation of similar results because '073 teaches that it's polymers may be used to produce decorative, hard (i.e., scratch-resistant) coatings.

The passages the Examiner refers to read as follows:

"This invention pertains to ionic hydrocarbon polymers, and more particularly to surface coatings (paint coatings) containing an ionic crosslinking-type polymeric binder system comprising zinc carbonate in combination with a coreactive carboxyl functional polymer.

Protective surface coatings are organic compositions applied to substrates to form continuous films which are cured or otherwise hardened to provide protection as well as a decorative appearance to the substrate. Protective surface coatings ordinarily comprise an organic polymeric binder, pigments, inert fillers and other additives. The polymeric binder functions as a dispersant for the pigments, inerts, and other additives in wet coating compositions and further

functions as a binder for the pigments and inert fillers in the cured or hardened paint film. Polymeric binders can be thermoplastic or thermosetting binders based on coreactive components such as a reactive functional polymer adapted to crosslink or coreact with a crosslinking component such as melamine or isocyanate.

Conventional thermosetting polymers often require high temperatures as well as external crosslinkers. Some crosslinkers, such as melamines in conventional industrial coatings or triglycidyl isocyanurate for powder coatings, can cause toxicity problems. Also, the release of volatile by-products, such as caprolactam, from some of these materials can cause film defects, such as cratering and bubbling.

It now has been found that excellent paint coatings can be produced based on an ionomeric polymeric binder comprising a carboxylic acid functional polymer coreacted or neutralized with zinc carbonate. The ionomer or ionic polymer was found to provide interreacting polymer chains which exhibit thermosetting properties comparable to coreactive polymeric binders crosslinked by an amino crosslinker. An ionomer can be defined as a polymer composed of a polymeric backbone containing a small amount of pendant carboxylic acid groups, usually less than 15 mole percent, which are neutralized partially or completely with zinc carbonate to form an ionomer. These ionic moieties and their interactions dominate the behavior of the polymer itself where it is believed that the zinc ion of zinc carbonate is exchanged for a hydrogen ion of the polymer carboxyl group. Ionic hydrocarbon polymers for elastomers or plastics are disclosed in U.S. Pat. No. 3,264,272.

In commonly assigned Ser. No. 397,28, filed Aug. 23, 1989, ionomers are disclosed based on certain organic zinc salts having a pka above about 3.0, preferably above 3.8 and active to neutralize certain carboxyl polymers including acrylic copolymers, polyester-acrylic graft polymers, polyester polymers and urethane polymers to provide an ionic thermosetting binder used in surface coatings. Similarly, commonly assigned Ser. No. 397,279, filed Aug. 23, 1989 discloses ionomeric polymers for surface coatings based on an epoxy-ester carboxyl polymer activated by said organic zinc salts as well as zinc carbonate." (col. 1, lines 9-66)

Discussion of Claims 41 and 43-48

As previously discussed, each of claims 41 and 43-48 recite forming the crosslinks concomitant with the application of the crosslinkable composition being applied to the surface of the compressible mat. Once again, van der Hoeven (i.e. the '604 patent) is devoid of any teaching or suggestion of forming the crosslinks concomitant with the application of the crosslinkable composition being applied to the surface of the compressible mat. The '604 patent is devoid of any discussion suggesting that the compositions described

in the '073 patent would be desirable. Accordingly, in the absence of the Applicants own specification, there is no motivation as to why one of ordinary skill would attempt to substitute the compositions of the '073 patent for the compositions utilized in the '604 patent. Once again applicants respectfully remind the Examiner that the application of hindsight analysis is improper. Thus, the proposed '604/'073 combination is not proper and can not be relied upon to support an appropriate prima facie case of obviousness. As such the Applicants respectfully request that the subject rejection be withdrawn.

Claims 45 and 46 are rejected under 35 U.S.C. § 103(a)

Claims 45-46 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Matejka '228 in view of Mirous et al. (U.S. Patent No. 5,719,239, hereafter the '239 patent). In particular, the Examiner states as follows:

'228 is described above. It teaches the coating of wood composite board, but does not teach a wood composite substrate with a paper glued to it. Mirous et al. teaches that wooden construction panels often comprise a layer of paper between the panel and the topcoat to obtain certain visual properties (col. 9, lines 30-67 and col. 10, lines 1-36). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have used a construction panel with a layer of paper between the wooden composite and the topcoat of '228 with a reasonable expectation of success because '239 teaches the conventionality of such arrangements.

The passages the Examiner refers to read as follows:

"Options, Panel Construction and Process

The top coat composition may be formulated with a catalyst to promote reaction between the thermoset and thermoplastic components as well as reduce buildup on the press and embossing dies. A particularly preferred catalyst is a mixture of sulfuric acid and triethylamine commercially available from Georgia-Pacific Resins, Inc. as GP 4590 (CAS No. 54272-29-6).

The construction panel product of the invention may optionally also have a layer of paper or veneer interposed between the panel and the top coat. A wide variety of papers may be used, but it is preferred that the paper be a bleached or, preferably, unbleached kraft paper.

The paper may be used in a variety of thicknesses depending on the manufacturing process and the nature of the wood fragments used in that process. Some processes may impose higher demands on strength properties of the paper to resist puncture during manufacture. Preferred thickness of kraft paper are within the range from about 3 to about 6 thousandths of an inch in thickness (75-150 microns).

The construction panels of the invention may be performed with a variety of methods. As an example, a cellulosic

panel with an optional intervening layer of paper or veneer may be coated with the top coat to form a composite stock. The resulting composite is then heated under curing conditions for the binder resin to effect curing of the top coat and bonding of the layers to each other.

The curing temperature is preferably above the melting point of the thermoplastic polymer to effect bonding. Preferred temperatures are in excess of 130° C. and preferably within the range from about 150° C. to about 200° C. to cure the binder resin as well as the top coating. Pressure is preferably applied simultaneously in a press or between rollers either with or without a textured surface for embossing a detail pattern in at least one of the panel surfaces. Embossing pressures generally are within the range from about 700-1500 psi using either die plates or rollers.

In an alternative method, the panels may be manufactured in a one-step process. In such a process, a layer of top coat film is fed onto a screen or other support surface. A layer of wafers or other fragments of wood is then laid onto the top coat film, in an amount to provide a panel of the required thickness. The wafers would normally be coated or admixed with a binder, e.g. a phenol/formaldehyde resin. A second top coat film may then optionally be fed onto the wafers. The resultant composite is then fed between heated rollers (with or without a detail pattern on at least one of the surfaces thereof) at a temperature and pressure sufficient to bond the composite and form the panel. Such a one-step process may be operated in a continuous manner.

Embossing of panels according to the invention need not be performed immediately after or concurrently with the panel formation. Pre-formed panels can be run through embossing dies in a press heated to a temperature above the softening point of the top coat in a batch process or continuously. Embossing dies can be in the form of platens or rollers.

The construction panels of the invention may be used in a variety of end-uses, depending in particular on the nature of the panel. For instance, the panels may be used as the interior surfaces of buildings. Panels may be painted to provide an attractive surface, the top coat providing a surface that is capable of being painted while minimizing the uptake of paint by the panel. For panels including a decorative paper layer, the layer of paper may also be decorated in other manners. Embossed panels may be shellacked or coated with varnish or the like, to preserve and enhance the attractive features of the embossing. The panels may be nailed and are capable of accepting paintings and other wall decorations. The panels may also be used as sub-layers in the construction industry, to provide barriers to moisture or the like and to provide a surface that is capable of having other layers adhered thereto." (col. 9, lines 30-67 and col. 10, lines 1-36)

Discussion of Claims 41 and 43-48

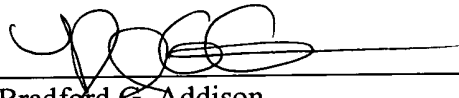
Each of claims 45 and 46 recite forming the crosslinks concomitant with the application of the crosslinkable composition being applied to the surface of the compressible mat. Neither of the '228 and '239 patents teach or suggest forming the crosslinks

concomitant with the application of the crosslinkable composition being applied to the surface of the compressible mat. Accordingly, the proposed '228/'239 combination does not arrive at the claimed invention. Thus, the proposed combination can not properly be relied upon to support an appropriate prima facie case of obviousness. As such the Applicants respectfully request that the subject rejection be withdrawn.

CONCLUSION

In view of the foregoing remarks, it is submitted that this application is in condition for allowance. Action to that end is hereby solicited.

Respectfully submitted

A handwritten signature in black ink, appearing to read 'B. Addison', is written over a horizontal line.

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